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Introduction

This document covers the setup and use of Citrix XenDesktop on Datrium DVX. It includes the steps necessary to set up a basic environment and conduct the appropriate testing that we performed for achieving the Citrix Ready validation.

We have assumed that you’re familiar with Citrix XenDesktop administration, have some familiarity with Datrium DVX, and are also familiar with the Login VSI testing and benchmarking tool.

The complete setup is covered in the sections below.

Install

Set up

Install and configure each host that will support the virtual desktop virtual machines (VMs) and infrastructure components for the Citrix XenDesktop deployment. For example, master images, Desktop Controller, Store Front, etc.

You may also include non-desktop VMs on Datrium. You can easily add hosts through vCenter, and you’ll see a single shared Datastore presented to the configured in each host. While this datastore may appear as a network storage resource (NFS), in reality, the hosts are interacting directly with the DVX Datastore through local flash drives configured on each host via the Datrium host software.

The primary task is to add the hosts to vCenter. Through the vCenter plugin, select the desired hosts for deploying DVX and add each of the hosts to the DVX configuration.

You configure hosts through vCenter, as shown below:
Navigate to the Administration view (gear icon) to configure hosts:

The next few windows guide you through selecting available hosts and SSD configuration on those hosts. The result is the installation of the Datrium DVX VIB (vSphere Installation Bundle) and conversion of local SSD flash into cache for the DVX Datastore, which gets mounted to the host.

The process will look something like the following (NOTE: hostname and SSD identity will be unique to each host):
Once the DVX software has been deployed and the host configured, it will have a DVX Datastore presented, which is the primary storage location for all VM and infrastructure data.

In the figure above, there's a DVX Hosts view available through the plugin under the Monitor tab showing the final configuration of SSD for use by DVX. The inset figure shows the hosts connected to the DVX Datastore – including the current one (e.g., colo-ucs-esx01).

We can also see that the host is configured in "Insane" mode in this view. That means the DVX software will use more host CPU, if available, to service I/O requests for higher performance and lower latencies. Note: the default "Fast" mode will use up to 20% of the available CPU resources while "Insane" mode may use up to 40% of the available CPU resources. Either setting should work fine for virtual desktop I/O SLAs.

Install VAAI VIB

Install the additional Datrium-provided VAAI (vStorage API for Array Integration) VIB on each ESX host in the desktop VM provisioning process. This software facilitates storage cloning offload to DVX for space and performance efficiency. While it's not required, it is highly recommended for MCS based provisioning methods. The VAAI VIB can be installed directly from the attached DVX Data Node with basic ESX commands as follows (substituting your site’s DVX FQDN or IP address for <DVX-Data-Node-name>):

```
[root@VIB-host1:~] esxcli software vib list | grep -i datrium
datrium-hypervi-driver-esx 2.0.1.0-24938 Datrium PartnerSupported 2017-05-31
[root@VIB-host1:~] esxcli software vib install -d http://<DVX-Data-Node-name>/static/esxVibVAAI/index.xml
Installation Result
Message: The update completed successfully, but the system needs to be rebooted for the changes to be effective.
Reboot Required: true
VIBs Installed: Datrium_hypervi-driver-esx 2.0.1.0-24938
VIBs Removed:
VIBs Skipped:
```

NOTE: The host will need to be rebooted for the VAAI software integration to take effect.
Configure

XenDesktop Storage Resource

Setting up the Citrix XenDesktop storage resources for Datrium DVX is straightforward. You simply choose a shared DVX Datastore presented from the configuration installation. Optionally, you can use the same target storage resources for both desktop VMs and Personal vDisks. The performance and capacity advantages of the DVX applies to all data types within the virtualized infrastructure and desktop VMs.

When adding the XenDesktop host resources, you’ll see choices in Citrix Studio similar to the ones below. If you need to make changes later, you can adjust the configuration, but the simplicity of using a single storage resource is another administrative simplification you get with DVX.

Here’s what you’ll see during host configuration:

As a result, both Standard Storage and PvD Storage are deployed to the DVX Datastore:
Deploy
MCS on DVX Datastore

For this particular setup, we chose to use the Machine Creation Services (MCS) deployment model. As you can see in the figure below, several different Machine Catalogs have been created for different testing and scenarios within our Citrix XenDesktop environment. For the Citrix Ready setup, we built a Machine Catalog of 200 desktops (e.g., win10-vsi). In this view, you can see the basic VM configuration as well.

The Machine Group is tied to the appropriate Delivery Group (e.g., win10-vsi) for deployment and management.
Test

Login VSI

For this test, we’re using the industry-standard Login VSI toolset to exercise the 200 desktops running the Benchmark Mode test for Knowledge Worker. From the Management Console screenshot below, you can see some of the test particulars as well as the successful launch, login (active), and logoff of the users.

The Login VSI tool produces a set of log files that can be analyzed with Login VSI Analyzer for overall test performance and behavior. A screenshot of the Summary screen is shown below with a baseline performance of “Very Good,” and the VSImax level wasn’t reached.
The Login VSI Analyzer also produces a plot of performance throughout the test as each user session entered the workflow. The results below show a very stable performance response throughout the testing period.

**Monitor**

**Performance**

In addition to the Login VSI reports, we gathered a couple of other related views from the environment. Below is a DVX performance graph over the test period showing the rise in storage operations as users are added. This view is from the Historical data collected on DVX. We can see that average latency (both read and write) is low and consistent throughout the test. Hit rate stayed at 100%, indicating that the desktop reads were being serviced from the local host flash as desired.

![DVX performance graph](image)

We also charted the CPU performance of one of the hosts during the test to ensure we aren’t hitting other resource boundaries in the environment. The graph below shows that aggregate CPU stayed below 80% throughout almost the entire period. That includes the processing for the desktop VMs as well as the DVX host-based Hyperdriver software, which supports the storage I/O on each host.

**Conclusion**

Our Citrix Ready test results show Datrium providing a simple to set up, easy to manage, and highly-performant for Citrix XenDesktop with MCS.

The 200 desktop-level used for this test is a small set compared to the maximum level of 6,000 desktops that can be supported on a single DVX system. The small collection of 3-4 hosts is also a fraction of the 128 hosts that can be connected to a unique DVX system.

Although it’s not directly a part of this test, we also explored other aspects such as boot and login storms, and we found that the solution scaled linearly as we added more hosts with more desktops.

The results observed with this exercise are primarily a result of leveraging the local flash resources as defined by the DVX architecture.